

ABSTRACT OF THE DISCLOSURE

A specially profiled wax retaining cup and piston guide are crimped together to compress a peripheral portion of a diaphragm wax seal to the extent of extruding the diaphragm material to form both an axial seal and at least one radial seal. The compressed, extruded diaphragm seal provides a wax containment seal capable of withstanding high wax pressures that generate high actuation forces. A wax filled thermal actuator reliably produces an actuating force F sufficient to lift a load in a range of 2500 to 6000 times the mass of the actuator. Performance of the thermal actuator may also be expressed in terms of the internal pressures generated and delivered to the bottom of the actuator piston. The pressure applied to the bottom of the actuator piston in the inventive actuator is in the range of approximately 1700 to 8800 psi (124 to 620 kg/cm²).

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